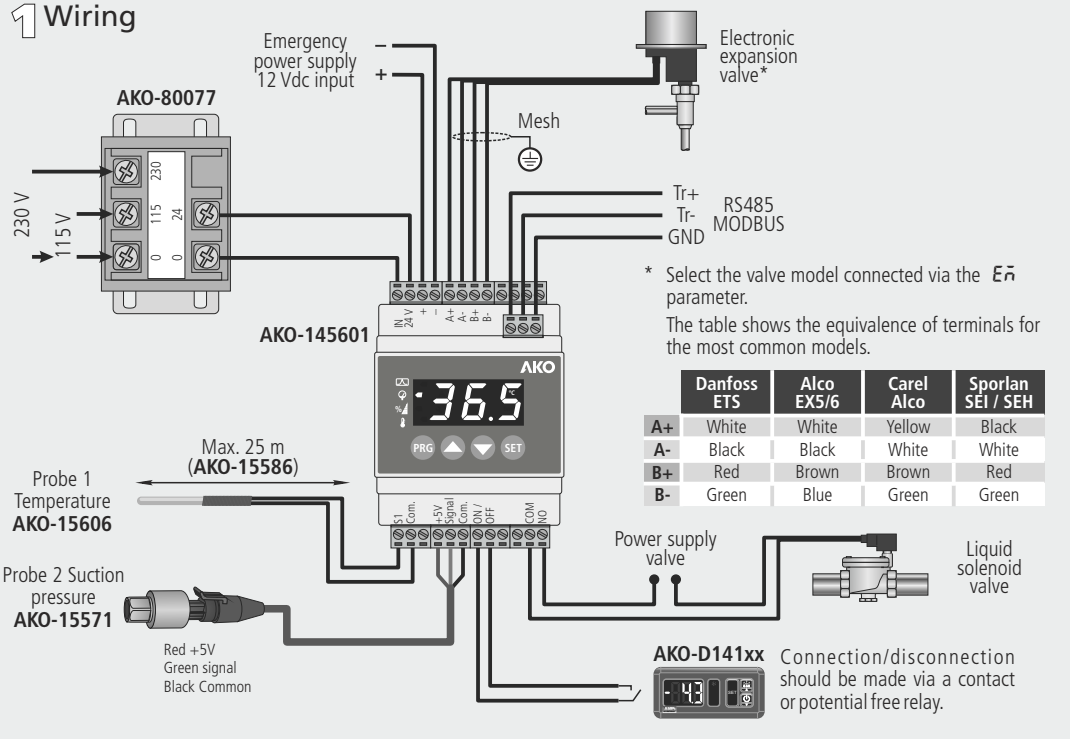
1 Wiring



* Select the valve model connected via the Eñ parameter.

The table shows the equivalence of terminals for the most common models.

	Danfoss ETS	Alco EX5/6	Carel Alco	Sporlan SEI / SEH
A+	White	White	Yellow	Black
A-	Black	Black	White	White
B+	Red	Brown	Brown	Red
B-	Green	Blue	Green	Green

Quick start

1 Connect the controller according to the diagram in the ''wiring'' section.

2 Configure the rFt, Eñ and SH parameters according to the indications in the "Start up configuration".

2 Initial configuration

Prior to start-up, it is vital to configure the following parameters:

rFt: Select the type of refrigerant gas used in the installation from among the following compatible gases:

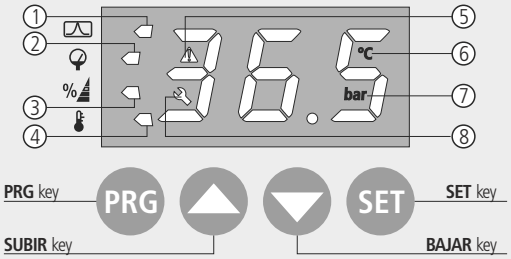
0: R-22 **1:** R-134A **2:** R-404A **3:** R-407C
4: R-410A **5:** R-717 **6:** R-23 **7:** R-507C
8: R-HFO1234ze **9:** R-744 **10:** R-407A **11:** R-407F
12: R-507A

Eñ: Select the expansion valve model installed from among the following compatible models:

1: Danfoss ETS 12.5 / 25B
2: Danfoss ETS 50B
3: Danfoss ETS 100B
4: Danfoss ETS 250
5: Danfoss ETS 400
6: Alco Ex4
7: Alco EX5
8: Alco Ex6
9: Alco EX7
10: Alco EX8 (330 step/sec)
11: Alco EX8 (500 step/sec)
12: Spolarn SEI 0.5~11
13: Spolarn SEI 1.5~20
14: Spolarn SEI 30
15: Spolarn SEI 100
16: Spolarn SEI 175
17: Carel E2V

SH: Configure the overheating set point

Description



1: The display shows the overheating value.
2: The display shows the suction pressure value (Probe 2).
3: The display shows the valve opening percentage.
4: The display shows the temperature value.
5: An alert is active
6: The display shows the temperature value in °C.
7: The display shows the suction pressure value in bar
8: The opening degree of the valve has been configured manually (Cor)

Operation

Keypad

PRG key: Pressing it for 5 seconds accesses the parameters programming menu.

Pressing it twice allows the regulation to be restarted in the event of an alarm. In the programming menu, you may return to level 1.

UP ▲ key: In the programming menu, you may scroll around the different levels, or during the setting of a parameter, change its value.

DOWN ▼ key: In the programming menu, you may scroll around the different levels, or during the setting of a parameter, change its value.

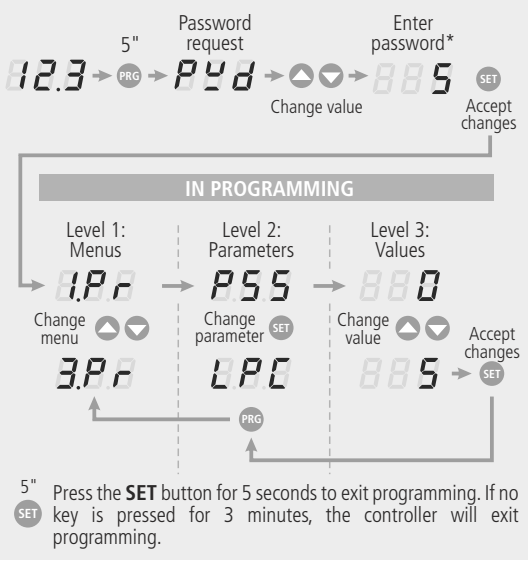
SET key: Allows the displayed value to be changed (overheating, suction pressure, expansion valve opening or temperature) (only if the dñ parameter = 0).

The programming menu allows you to move around the different levels and accept changes. Pressing it for 5 seconds exits the programming menu.

Adjustment of parameters

Using the programming menu, you will be able to configure the various parameters in order to adapt the controller's operation to the needs of its installation.

In order to access the programming menu, press the **PRG** key for 5 seconds, or until the message ''PSd'' is displayed. Using the ▲ and ▼ keys enter the password (programmed into the PSS parameter) and press **SET**. Once entered correctly, the password will not be requested again for 30 minutes.



*The default value of the password is 5. This may be changed using the PSS parameter.

AKO

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CE Quick guide

AKO-145601

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Table of parameters

The equipment's operation functions are divided into 3 different groups.

The **Def.** column indicates the default parameters set in the factory. Temperature values are expressed in ºC. (Equivalent temperature in ºF) and the pressure values in bar (equivalent pressure in psi).

GROUP 1

Level 1	Level 2	Description	Values	Min.	Def.	Max.
iPr	SH	Overheating set point	(K)	0.5	10	30
	or	Initial opening for valve start up	(%)	0	50	100
	ort	Duration of initial start up opening	(Sec.)	0	5	300
	Pro	Proportional gain		0.1	3	99.9
	int	Integral time	(Sec.)	0	120	999
	dEr	Derivative time	(Sec.)	0	30	999
	LSA	Lower overheating alarm **0:** Deactivated **1:** Automatic reset **2:** Manual reset		0	1	2
	LSS	Lower overheating alarm activation value	(K)	0.5	3	30
	LSt	Lower overheating alarm turn-on delay time	(Sec.)	1	15	300
	LSC	Lower overheating alarm deactivation time	(K)	1	5	30.5
	nPA	Maximum pressure alarm in probe 2 **0:** Deactivated **1:** Automatic reset **2:** Manual reset		0	1	2
	nPS	Maximum pressure alarm activation value	(bar/psi)	0.1	9	99.9
	nPt	Maximum pressure alarm turn-on delay time	(Min.)	1	1	15
	nPC	Maximum pressure alarm deactivation time	(bar/psi)	0.1	8	99.9
	HSA	Maximum overheating alarm **0:** Deactivated **1:** Automatic reset **2:** Manual reset		0	0	2
	HSS	Maximum overheating alarm activation value	(K)	10.0	30	40.0
	HSt	Maximum overheating alarm turn-on delay time	(Min.)	1	3	600
	HSC	Maximum overheating alarm deactivation time	(K)	7.0	27	37.0
	FPA	Freeze alarm **0:** Deactivated **1:** Automatic reset **2:** Manual reset		0	0	2
	FPS	Maximum freeze alarm activation value	(ºC/ºF)	-100	0	392
	FPt	Freeze alarm turn-on delay time	(Sec.)	5	30	200
	FPC	Maximum freeze alarm deactivation time	(ºC/ºF)	-97	3	392
	LPA	Lower pressure alarm in probe 2 **0:** Deactivated **1:** Automatic reset **2:** Manual reset		0	1	2
	LPS	Lower pressure alarm activation value	(bar/psi)	-1	0	25
	LPt	Lower pressure alarm turn-on delay time	(Sec.)	5	5	200
	LPC	Lower pressure alarm deactivation time	(bar/psi)	0.7	0.3	25.3

GROUP 2

Level 1	Level 2	Description	Values	Min.	Def.	Max.
2Pr	PU	Pressure units **0:** Bar **1:** Psi		0	0	1
	tU	Temperature units **0:** °C **1:** °F		0	0	1
	EA	Selection of expansion valve model connected **1:** Danfoss ETS 12.5 / 25B **2:** Danfoss ETS 50B **3:** Danfoss ETS 100B **4:** Danfoss ETS 250 **5:** Danfoss ETS 400 **6:** Alco EX4 **7:** Alco EX5 **8:** Alco EX6 **9:** Alco EX7 **10:** Alco EX8 (330 s/s) **11:** Alco EX8 (500 s/s) **12:** Spolarn SEI 0.5~11 **13:** Spolarn SEI 1.5~20 **14:** Spolarn SEI 30 **15:** Spolarn SEI 100 **16:** Spolarn SEI 175 **17:** Carel E2V		1	1	17
	tSt	Total steps for expansion valve*		0	260	999
	dSP	Expansion valve speed*		0	250	999

GROUP 3

Level 1	Level 2	Description	Values	Min.	Def.	Max.
3Pr	PSS	Parameter access password		0	5	999
	rFt	Type of refrigerant gas used: **0:** R-22 **1:** R-134A **2:** R-404A **3:** R-407C **4:** R-410A **5:** R-717 **6:** R-23 **7:** R-507C **8:** R-HFO1234ze **9:** R-744 **10:** R-407A **11:** R-407F **12:** R-507A		0	1	12
	PSH	Pressure probe range (Maximum)	(bar/psi)	-1	15	99
	PSL	Pressure probe range (Lower)	(bar/psi)	-1	-1	99
	PSo	Pressure probe calibration (S2)	(bar/psi)	-9.9	0	9.9
	tSo	Pressure probe calibration (S1)	(ºC)	-19.9	0	19.9
	dCr	Expansion valve opening speed limit	(%)	0.1	OFF	9.9
	UrH	Maximum expansion valve opening limit	(%)	0	100	100
	UrL	Lower expansion valve opening limit	(%)	0	0	100
	Ft	Reading delay for probes (S1 and S2)	(Sec.)	0.1	1	10.0
	Cor	Lower expansion valve forced opening value	(%)	0.0	OFF	100
	dA	Display mode: **0:** Displays options 1 to 4 sequentially **1:** Overheating value (ºK) **2:** Suction pressure value (Probe 2) **3:** Valve opening (%) **4:** Temperature value (Probe 1) **5:** Overheating set point		0	1	14
	C Id	Communication direction		1	1	254
	CSP	Communication speed	(BPSx100)	48	96	384
	in i	Initial settings (enter password and press **SET**)		0	0	999

* The tSt and dSP parameters are adjusted automatically when the expansion valve model is selected. They should only be changed by qualified staff. **AKO** is not responsible for any damage that may be inflicted on the installation.

Messages

	Description
PS	Problem in the pressure sensor
tSd	Probe 1 not connected
tSC	Crossed temperature probe
noP	Maximum Operation Pressure (MOP) alarm
LoP	Lower Operation Pressure (LOP) alarm
HS	Maximum overheating alarm
LS	Lower overheating alarm
FrA	Frost detection alarm
StP	Regulation stopped by external thermostat (ON/OFF Input)
CAL	Expansion valve initialisation
CLE	Valve closing underway due to fault in the electricity supply (emergency power supply required)

IMPORTANT: In the event of an alarm or fault in any of the probes, the controller closes the liquid solenoid and expansion valve until the problem is solved.

Warnings

Using the unit not observing the manufacturer's instructions may alter the appliance's safety requirements. Only probes supplied by **AKO** should be used for the appliance to operate correctly.

The unit should be installed in a place protected from vibrations, water and corrosive gases, where the ambient temperature does not exceed the values indicated in the technical data.

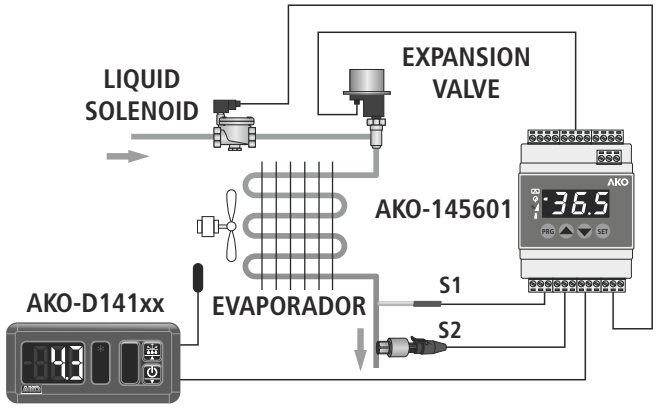
For the reading to be correct, the probe should be used in a place without heat influences apart from the temperature you want to measure or control.

The probe and its cable should **NEVER** be installed in a conduit together with power supply, control or feeder cables.

The power supply circuit should be equipped with a switch for its disconnection of at least 2A, 230V, situated near the appliance. The cables are inserted into the rear part and should be H05VV-F or H05V-K type. The section to be used will depend on local regulations, but should not under any circumstances be less than 1 mm^2.

The cables for wiring the relay contacts should have a section of between 1 mm^2 and 2.5 mm^2 and wire for the one in common should always have a section of 2.5 mm^2. Using of halogen-free cables is recommended.

Probes 1 and 2 should be installed as close as possible to the evaporator output. There should not be any device between them (valves, peep-holes etc.) that could alter the reading.



For further information, refer to the user manual available on our website: **www.ako.com**